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The Corps Environment

ARMY EARTH DAY 2006

SUSTAINING THE ENVIRONMENT FOR A SECURE FUTURE








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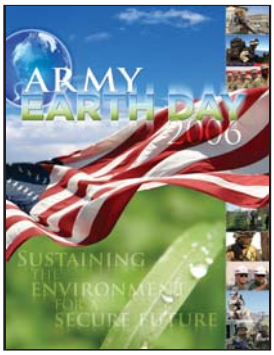

Cover: The Corps joins the rest of the world to celebrate Earth Day April 22.

Corps celebrates Earth Day

U.S. Army Corps of Engineers employees remain firm in their commitment to the environment and sustainability.

As our population and economy continue to grow, our Nation and Army must carefully manage and enhance our environmental resources while ensuring prosperity for our children and future generations. This is a familiar challenge, one you have heard many times in the past and will continue to hear. We are ready, willing, and able to provide both leadership and partnership in this important arena.

April 22 marks the 36th annual celebration of Earth Day, and again this year the Army will use the theme "Sustaining the Environment for a Secure Future." It's a theme that continues to emphasize the need for the Army to move toward increased sustainability — focusing on mission, the environment and communities.

As Gen. Peter Schoomaker, the Army Chief of Staff, and the Honorable Francis J. Harvey, Secretary of the Army, note in their 2006 Earth Day Message, "... it is vital that we continue to implement innovative policies and practices that will protect and preserve our natural resources for future generations."

We believe that the Corps is leading the way in doing just that. We are a full spectrum Engineer Force of high quality Civilians and Soldiers, working with our partners to deliver innovative and effective solutions to the Armed Forces and the Nation's engineering and environmental challenges.

Our Environmental Operating Principles emphasize the need to embed sustainability in all of our projects and are applied across the full spectrum of our operations from warfighting to water resources. I am pleased that early results from an ongoing survey show that our employees believe the Corps is committed to embedding the principles in our work. However, they also say there is more we can, and need, to do.

While we strive to incorporate the principles even more in our projects and activities, it is gratifying to know that our efforts are being noticed. On May 3, the Secretary of Defense will honor a team of Corps employees from our Sacramento District with a Department of Defense Environmental Restoration Team Award. The award recognizes the Pyramid Lake Torpedo and Bombing Range Formerly Used Defense Sites project team for its work in removing more than 13 tons of munitions from the 110,000-acre lake northeast of Reno, Nev.

The team, which included Corps employees, U.S. Navy divers, contractors and members of the Paiute Tribe, demonstrated the true sense of the seventh Environmental Operating Principle: "Respect the views of individuals and groups interested in Corps activities; listen to them actively, and learn from their perspective in the search to find innovative win-win solutions to the Nation's problems that also protect and enhance the environment." The Navy divers provided state-of-the-art technology for deep diving at high elevations to remove the World War II munitions. The Paiute Tribe members, funded through Native American Lands Environmental Mitigation Program, provided critical agreement on the project from the community's viewpoint.

The team removed the munitions with minimal disturbance to the lake's sensitive environment, home of the endangered Cuiui lakesucker amd the threatened Lahontan cutthroat trout. They also helped to build the tribe's expertise in environmental cleanup, reduced costs and expanded the boundaries of known technologies. I am proud of the team's collaboration and commitment.

The Corps is becoming known for our commitment to working openly and collaboratively, whether it's along the Gulf Coast after the devastating hurricanes, in the Everglades as we strive to keep the River of Grass alive and vibrant, or as we work with others to remove decades-old munitions from a lake. That commitment is part of the Corps culture, not just on Earth Day, but every day. Keep up the great work. Essayons!

CARL A. STROCK
Lieutenant General, USA
Commanding

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New guidance for salvaging is here

U.S. Army Engineer Research and Development Center — Construction Engineering Research Laboratory

Lumber from a deconstructed warehouse is bundled and banded to be sold at a used building material retail business. *(File photo)*

Army installations are required by the Department of Defense Measures of Merit (DoD MoM) to reduce non-hazardous solid waste by 40 percent. The construction and demolition (C&D) component is 67 percent of the Army's solid waste, although C&D debris is more than 80 percent of some installations' solid waste stream. Therefore, reducing the C&D debris burden is critical to achieving the DoD MoM.

A newly published Public Works Technical Bulletin provides Army installations and Corps of Engineers districts with procedures, information and resources that will enable them to plan and manage building removal projects applying alternative strategies to conventional building demolition and landfilling. The materials that result from construction, demolition or de-construction, and remodeling have many potential applications. Depending on the condition and types of materials, many of these materials can be donated or sold for reuse.

Plumbing fixtures in a used building material store. *(File photo)*

Other materials may be recycled into new products. These materials also may be used as feedstock for new materials instead of using virgin sources. PWTB 200-1-26, "Market Valuation of Demolition Salvage Materials," will serve as a reference for those responsible for reducing C&D debris burdens.

Public Works personnel and Corps project managers must be familiar enough with the used materials and recycling markets to establish reasonable debris diversion requirements and to evaluate C&D waste management plans developed by building removal contractors. This PWTB can help installations achieve diversion goals by identifying market sources for reusable and recyclable materials generated from construction and/or demolition projects.

The new PWTB describes the most commonly salvaged, reused and recycled construction materials and demolition waste, end uses for these materials, approximate market values for salvaged and recycled materials, options for marketing materials and resources for developing local market data.

PWTB 200-1-26 is posted on the TECHINFO Web site at: www.hnd.usace.army.mil/techinfo/CPW/pwtb.htm.

Malcolm McLeod, HQ USACE Environmental Division, was the technical proponent for this work.

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New Bedford Superfund site marks another milestone

By Ann Marie R. Harvie
New England District

During the next 20-plus years, an estimated 900,000 cubic yards of contaminated sediments will be dredged and dewatered or excavated from a two-mile stretch of the New Bedford Harbor before being sent off-site for disposal in Michigan.

The contaminated sediments will be transported by rail service from the New Bedford Harbor Superfund Site Dewatering Facility to a Toxic Substance Control Act approved landfill in Romulus, Mich., which is operated by the EQ Corporation.

"Dredging from Sept. 13 through mid-November 2005, resulted [in] approximately 25,000 cubic yards of contaminated sediments removed from the harbor," said Gary Morin, New England District's project manager. "After removal of sand, the sediment was then dewatered, resulting in 16,100 tons of dewatered sediments, otherwise known as filter cake.

Dredging took place in the 2004 construction season when approximately 12,500 cubic yards of material were removed via truck to rail and processed.

"Of the 16,100 tons of filter cake produced in 2005, we shipped 10,400 tons via rail to the disposal site in Romulus," Morin said. "We expect to ship 14,000 to 15,000 tons in 2006."

The EPA requested assistance from the New England District to clean up sediments contaminated with Polychlorinated Biphenyls, also known as PCBs, from New Bedford Harbor. The harbor was contaminated from the 1940s through the 1970s by two electrical capacitor-manufacturing plants that discharged PCB waste. The site is one of the largest and most challenging hazardous waste sites in the country. The New England District has been supporting EPA on this project since the mid-1980s.

Col. Curtis Thalken, New England District engineer, joined New Bedford Mayor Frederick Kalisz, Environmental Protection Agency Regional Administrator representative Susan Studlien and other guests in a ceremony commemorating the start of rail service from the New Bedford Harbor Superfund Site Dewatering Facility to the disposal site in Michigan.

"The benefit of the rail service is it will reduce the cost for off-site disposal, provide for a safer mode of transportation and significantly reduce the hauling of PCB-contaminated sediments through the neighborhoods and streets of New Bedford," Thalken said.

A loaded rail car with the track mobile attached sits inside the dewatering facility just before it moves across the street. The track mobile is used to shuttle the cars around the site and back and forth between the yard and the facility.
(Photo by Anita Rigassio-Smith , Jacobs Engineering)

After the speakers' remarks, Kalisz and Studlien drove ceremonial spikes into the ground. Studlien and Kalisz then signaled the train, with one car of sediment totaling 100 tons of contaminated dredged material, to move from the dewatering facility to the city's rail yard. A tour of the dewatering facility followed and concluded the ceremony.

"Our team of partners is helping EPA achieve important progress on remediation at this site and we've had a number of successes in the last several years," Thalken said. "This event shows the commitment by the partnership agencies and the people who represent them to continue the progress achieved so far to remediate this site."

New Bedford Harbor is the home of one of the largest fishing fleets and oldest recreational and commercial navigation harbors along the East Coast. The New England District operates and maintains a hurricane barrier, built in 1966, at the mouth of the harbor to protect the fleets and the heavily developed waterfront. There is also a district built and maintained federal navigation channel running through the harbor. The channel is under consideration for dredging and deepening due to the anticipated growth in commercial navigation.

"Our goal is to continue the progress of remediation at this site in a cost-effective and technically proficient manner," Thalken said.

Jacksonville District protects marine life while preparing to dredge Miami Harbor

By Nancy J. Sticht
Jacksonville District

Detonation cord on the surface draws the 'boxes,' while the blast itself is lower to the water and bushy in appearance. *(Photo by Terri Jordan, Jacksonville District)*

Ports maintained by the U.S. Army Corps of Engineers, in partnership with the nation's port authorities, are America's link to world markets. Florida's Port of Miami, in particular, carries the dual distinction of "Cruise Capital of the World" and "Cargo Gateway of the Americas." Last year alone, approximately 3.5 million passengers and more than one million tons of cargo transited through the Port of Miami from around the world.

In 1990, in response to the need for continued growth of the port to meet the demands of the passenger and commercial shipping industries, Congress authorized the deepening and expansion of the Port of Miami to 42 feet. Phase I, in which the Port of Miami deepened the entrance channel and main turning basin under an agreement with the federal government, was completed in 1993. Phase II, a $40 million Corps project to address the South Harbor, began in fiscal year 2005 and is scheduled to be completed in fiscal year 2006. The project includes the deepening of the Dodge-Lummus Island Turning Basin and Fisherman's Channel. Although the Port of Miami had previously attempted dredging this portion of the port without blasting, their efforts were unsuccessful due to hard limestone common to the area. Jacksonville District's solution was to blast the limestone, to enable the dredges to achieve the necessary depth for the channel and turning basin.

View of observer vessel SeaMe and observer helicopter from the drill barge *(Photo by Mary Jo Barkazsi, ECOES Consulting, Inc.)*

Along with blasting the limestone, another major challenge for Jacksonville District was ensuring the protection and safety of bottlenose dolphins, manatees, sea turtles, other marine animals and protected species that transit the harbor. The district developed a conservative blasting plan.

Generally, potential impacts to marine mammals that could occur from underwater blasting vary, based on the mitigation measures employed before, during and after detonation. These effects range from acoustic, tactile perception and physical discomfort to non-lethal and lethal injuries to internal and/or auditory systems.

Jacksonville District conducted a test blast program to determine the lowest amount of explosives necessary to adequately break rock. By the time blasting concluded, only 40 detonations had occurred over a 38-day period.

Six vessel and aircraft-based observers trained in monitoring marine mammals were on site to track the location and movement of marine mammals and protected species in defined protective zones. If marine animals were spotted, they were monitored until they left the area on their own and the detonation was held until after they moved.

A total of 168 protected marine species — 58 dolphins, 110 manatees, and 17 sea turtles — were observed throughout the blasting period. Dolphins were observed an average distance of 2,000 feet from the blast array, and manatees swam within 3,500 feet. Only 13 delays were necessary to ensure their protection during the 38 days that blasting occurred.

"I am pleased that this project worked exactly as we had anticipated it would work," said Terri Jordan, project biologist.

For more information, please contact Terri Jordan at 904-232-1817 or terri.l.jordan@usace.army.mil.

Megan Renee dredges up a 15,000-year-old tusk

By Linda Schafer
Portland District

In October, crew members of the dredge *Megan Renee*, under contract to Portland District, dredged up more than sand as they worked in the icy waters of Alaska's St. Paul Bay.

"They dredged up a 15,000-year-old tusk from a woolly mammoth," said Bert Rader, district archeologist. Rader intercepted the crew as soon as the dredge docked in Astoria, Ore.

"This find is exciting because there is the chance of encountering Paleo-Indian remains in the same area since they co-existed," Rader said. "The remains of three different species of woolly mammoths have been found across North America over the years, but Alaska has yielded the greatest number of well preserved finds. It is pretty cool when they turn up."

Fully intact, except for where it was cut to free it from the dredge's hold, the tusk measured 5½ feet long, 8 inches in diameter and weighed in at about 57 pounds. The size, Rader said, indicates that it most likely came from a younger mammoth just reaching maturity.

A full-sized woolly mammoth from that era typically had long, dense, dark hair and underfur. The tusks were curved. It had a fatty hump, long trunk and large ears.

They could grow as long as 12 feet and as tall as 10 feet, weighing up to 3 tons, he said. Though the crew that found the tusk was working for Portland District, it was taken to Alaska District since St. Paul Bay is within Alaskan state lands, Rader said. Alaska District has since turned the tusk over to the Alaska State Archeological Laboratory. State Archeologist Dave McMahan and his staff are performing radiocarbon dating on a sample of the tusk.

Alaskan State archeologist Dave McMahan and Lizette Boyer, Alaska District Corps of Engineers, inspect the tusk. *(File photo)*

Portland District archeologist Bert Rader displays the mammoth tusk. *(Photo by Heidi Helwig, Portland District)*

Fossil ivory — including that found in this tusk — can bring between $50 and $100 per pound in today's market, Rader said. Though it can be legally traded, unlike modern ivory, materials recovered from federal and state lands often become the property of the government and cannot be sold or traded.

Update: Carbon-dating on the tusk has recently been completed. The tusk has been dated to 6,170 years old, which means the tusk is a lot "newer" in history than originally thought.

ERDC's Environmental Lab signs patent license agreement

By Sara Leach
U.S. Army Engineer Research and Development Center

Dr. Beth Fleming, director of the Environmental Laboratory (EL) at the U.S. Army Engineer Research and Development Center in Vicksburg, Miss., recently signed a patent license agreement between ERDC, the U.S. Department of Agriculture and SePRO Corporation for the patent on "Mycoherbicidal compositions and methods of preparing and using the same."

The license agreement stems from research conducted by Dr. Judy Shearer, research plant pathologist in EL, and Dr. Mark Jackson, USDA-Agricultural Research Service's National Center for Agriculture Utilization Research (NCAUR), and their work involving biocontrol of hydrilla.

Hydrilla, a submersed aquatic plant, is a serious invasive weed in the United States and other regions of the world. Hydrilla is often cited as being one of the world's worst weeds.

"Hydrilla can become very dense and has the ability to clog man-made reservoirs, ditches and canals," Shearer said. "It is especially problematic for the Corps since it can affect navigation, flood control, recreation, irrigation and hydroelectric power generation. Many states spend millions of dollars on biocontrol of invasive plants."

SePRO first became interested in the biocontrol fungus in the late 1990s when some hydrilla populations started to show resistance to the herbicide fluridone.

The ERDC biocontrol team isolated a fungal pathogen from hydrilla growing in Texas. After being tested in the laboratory and in small greenhouses, the fungus showed great promise as an inundative biocontrol agent for hydrilla. Using this biological control method, the agent is produced in large numbers and applied at sufficient densities to a target weed in order to overwhelm its defenses, which results in relatively quick control. Unlike classical biocontrol agents, these inundative agents must be reapplied when necessary. They are similar to herbicides and are often referred to as mycoherbicides.

Aquarium experiment where dried mycoleptodiscus terrestris, a fungal pathogen being developed as a mycoherbicide for management of hydrilla, has been inoculated onto hydrilla showing effects of the fungus on treated versus untreated plants. *(Photo by Brian Durham, contractor in ERDC's Biomanagement Laboratory)*

"To develop the pathogen into a mycoherbicide, we first had to research a defined media and methods for mass producing the agent through fermentation technology," Shearer said. "One of the main centers for expertise in this area of research is at NCAUR, dating back to when researchers at the center developed techniques for mass producing penicillin."

Shearer and Jackson developed a defined laboratory medium and techniques for growing and harvesting the fungus. One unique feature of the medium was that it caused the fungus to produce survival structures called microsclerotia in broth culture. These structures allow a fungus to survive adverse conditions, which can potentially increase the shelf life of a product.

"Through our research, we discovered that the microsclerotia can be harvested and dried down to an approximate 5 percent moisture level," Shearer said. "Upon rehydrating, the structures were found to germinate within 24 hours and produce asexual spores within three days. We were particularly surprised by the production of the spores since the fungus does not sporulate on standard laboratory media but did so readily from the dried rehydrated microsclerotia."

See Environmental Lab page 16

Pyramid Lake receives

By David Killam
Sacramento District

It's 1945. The war is over and you have a lot of ammunition to get rid of. What do you do? Simple — you dump it into the lake. That's the way people used to think.

Sixty years later and that ammunition is still at the bottom of the lake. The U.S. Army Corps of Engineers will clean up the ammunition, but it's no easy task. Pyramid Lake covers more than 110,000 acres, nobody knows exactly where the ammo is, and the Paiute Indians, who own the lake, have concerns of their own.

On March 8, the Secretary of the Defense recognized the Pyramid Lake Formerly Used Defense Site team for its outstanding work. The team won the 2005 Secretary of Defense Environmental Restoration Team Award.

"This project was a success because we had the right people for the right jobs," said Jerry Vincent, FUDS program manager for the Sacramento District Corps of Engineers. "We also had excellent support from other agencies. The Paiute Tribe assigned Anna Keyser as project manager. The U.S. Navy brought in its expertise in diving and marine operations. The contractors, David Evans and Associates and Environmental Management Assist, provided in-depth knowledge in salvage operations. The Corps lent expertise to the project in the form of project management.

"Each person's contribution enabled the other team members to do their part," Vincent said.

Pyramid Lake, which is in eastern Nevada, is home to two species of fish — cutthroat trout, which supplies tourism money for the tribe through sport fishing and the cui-ui, a federally endangered fish that was the main source of food for the tribe. The tribe wanted no harm to come to the fish.

The Corps informed the tribe that funding for a cleanup was available through the Native American Land Environmental Mitigation Program, a program that addresses the impacts of past military operations on Indian land.

The tribe hired David Evans and Associates (DEA) to begin the initial field work. DEA mapped the lake bed and analyzed lake sediment for contamination. DEA conducted a bathymetric survey of the lake and located more than 200 anomalies.

"This project has made it possible for the tribe to undertake a lake mapping project with a wide range of uses for the fisheries, water quality control and economic development," said Anna Keyser, Pyramid Lake Tribe Environmental Department project manager.

Meanwhile, Vincent led a team to conduct investigations. In the 1980s, an aircraft crashed into the lake. Tribe members wanted it removed. Corps investigators discovered that government officials had removed the airplane without informing the tribe.

Investigations also led to Navy contacts at nearby Fallon Naval Air Station. The Corps team found out it could use Navy divers to remove debris from the lake, instead of commercial divers and save hundreds of thousands of dollars in diving costs. The Navy divers would benefit because it would be unusual training for them.

"We felt that it was very important to establish trust with the tribe," Vincent said. "Through newsletters, visits to the tribal board of directors and information to the local media, tribal members constantly knew what was going on."

At first, the divers found no ordnance, which was not surprising in the murky waters of the lake, where visibility below 100 feet in depth was non-existent.

This aerial view of Pyramid Lake showcases the deep
Vincent of Environmental Management Assist)

s innovative cleanup

Next, DEA used a Remotely Operated Vehicle (ROV) equipped with Sound Navigation Ranging, better known as SONAR. The ROV located high-velocity aircraft rockets, ammunition crates, 55-gallon drums and other debris, after an investigation of 158 square miles of the lake bottom. The material was at depths of 46 to 220 feet.

p lake, which covers 110,000 acres. *(Photo by Cindy*

In early August 2004, divers removed 207 rockets and 500 pounds of small arms ammunition.

The deep diving phase of the removal action took almost nine months of planning to implement. Pyramid Lake is at 3,800 feet elevation. It was the first time in history that Navy divers had dived at this altitude. Other factors were the poor visibility in the lake below 100 feet, the cold temperature of the water and arriving at a method for removing the ordnance from the bottom of the lake.

The Navy dive master, with the assistance of Naval Sea Systems Command, developed logarithms for high altitude decompression dive tables and acquired the MK 16 Mod 1 closed-circuit breathing system, which provides and reuses both oxygen and helium while filtering out carbon dioxide.

"We had never done this type of diving before," said Master Diver Boy Katano, of the U.S. Navy's dive team. "Naval Sea Systems Command in Washington, D.C., had to give us permission to dive and designed the dive tables. Normally, at sea level, divers will use a mixture of 88 percent helium and 12 percent oxygen. It might seem to some people that more oxygen should be used, but too much oxygen at depth can actually be toxic. For this dive, we used a mixture of 84 percent helium and 16 percent oxygen."

Each diver was allowed to spend only 10 minutes on the bottom of the lake. Then the diver had to decompress twice for 10 minutes on the way up to the lake surface. Divers fought boredom by listening to music.

Because the visibility was essentially zero at the bottom of the lake, the SONAR (sound, navigation and ranging) operator had to guide each diver to the ordnance. It took divers and associated personnel three months of daily dives to remove 243 rockets and 27,000 pounds of ammunition. Each item had to be hand picked and placed in a basket tied to a rope for removal to the surface.

"It was a tremendous learning experience for us," Katano said. "Divers also had to have total confidence in their equipment. With zero visibility so far down into the water, any equipment malfunctions could have been fatal."

Navy divers spent 186 hours on the bottom of the lake. The dive team consisted of 26 divers plus support elements.

"The care for the environment and savings to the taxpayer rendered by the Pyramid Lake team demonstrate what can happen when multi-agency team members are committed to working together, and are truly communicating, coordinating, consulting and collaborating," said Brig. Gen. Bo Temple, director of Military Programs for the Corps of Engineers.

On March 7, Geoffrey Prosch, Principal Deputy Assistant Secretary of the Army, Installations and Environment presented the team with the 2005 Secretary of the Army Environmental Restoration Team Award.

New bulletin unveils requirements for stormwater runoff

By Richard Scholze
U.S. Army Engineer Research and Development Center — Construction Engineering Research Laboratory

A new Public Works Technical Bulletin, 200-1-35, "Construction Discharge and National Pollutant Discharge Elimination System (NPDES) Requirements," identifies current compliance requirements and supporting information for stormwater runoff from construction activities.

Stormwater runoff control from construction activities is required under the NPDES and the Clean Water Act for all states. This PWTB identifies the applicable regulations for each state, lists requirements for the Construction General Permit and shares how individual Corps districts respond to these requirements.

Army Regulation 200-1 requires all Army installations and activities to comply with the Clean Water Act and NPDES. The Corps' military and civil works districts and divisions oversee countless construction projects throughout the nation on military installations, the nation's waterways and recreation areas, as well as a massive support program to federal, state, regional, tribal and municipal entities. NPDES requirements include notification of intent to obtain a permit and development of Storm Water Pollution Prevention Plans to mitigate impact from stormwater runoff.

Stormwater runoff from construction activities can significantly affect water quality. Runoff crossing and emanating from construction sites can pick up pollutants such as sediment, debris and a variety of toxic and nontoxic chemicals.

The impact on receiving waters can include sedimentation, which destroys aquatic habitat. Polluted stormwater runoff can harm or kill fish and other aquatic life. High volumes of runoff can cause stream bank erosion.

Construction sites must have stormwater runoff controlled to avoid carrying pollutants and sediment into surrounding areas. *(File photo)*

Operators of regulated construction sites must develop and implement Storm Water Pollution Prevention Plans and obtain appropriate permit coverage from states with primacy or from the U.S. Environmental Protection Agency in non-primacy states. Details and Web links are available in the PWTB for all states regarding permits and other requirements. An appendix summarizes regulations and other guidance that Corps districts use for stormwater from construction sites under their jurisdiction

For more information, please contact Richard Scholze at 217-398-5590 or e-mail at Richard.J.Scholze@erdc.usace.army.mil.

EPA issues guidance for protective cleanups of perchlorate

EPA has issued new protective guidance for cleaning up perchlorate contamination, recommending a preliminary cleanup goal for perchlorate of 24.5 parts per billion in water. EPA's guidance is derived from the agency's reference dose for perchlorate, which is based on the 2005 recommendations and conclusions of the National Academy of Sciences.

This preliminary goal is a starting point for an evaluation of site-specific conditions. Consistent with current practice, final cleanup determinations should take site-specific information into consideration. The new guidance will help ensure national consistency in evaluating perchlorate in light of widely varying state guidance. This decision was based on the best available science and will be updated as new information becomes available.

Perchlorate has been detected in groundwater or drinking water at approximately 45 of the 1,500 sites on the Agency's National Priorities List. Perchlorate salts were first produced in the United States in the mid-1940s, primarily for use by the U.S. military for explosives and rocket propellants. Perchlorate salts have been used in other applications, including pyrotechnics and fireworks, blasting agents, matches, lubricating oils, and air bags.

To read the guidance document, visit: http://epa.gov/newsroom/perchlorate.pdf. For more information, please contact Kerry Humphrey at 202-564-4355 or humphrey.kerry@epa.gov.

Mission: Successful cold weather DECON

By Marie Darling
U.S. Army Engineer Research and Development Center

A dozen Massachusetts National Guard and Fort Leonard Wood, Mo., Testing and Evaluation Group members descended upon the Engineer Research and Development Center's Cold Regions Research and Engineering Laboratory (CRRERL) in Hanover, N.H., to conduct testing for Homeland Security of equipment for personnel decontamination in a cold environment.

Today, not only are Soldiers faced with a multitude of hazardous situations including chemical warfare, but civilians are exposed to that threat, too, maybe in situations of hazardous materials within a team, also referred to as HAZMAT. But, what could be more worrisome than the fear of being contaminated with an unknown chemical and not having confidence in the only decontamination method available?

"The Soldier needs to be confident that the system works whether it be in a warm or cold climate," said Randy Weiss, from Fort Leonard Wood's Operation Test Command. "This is our responsibility as part of the chemical detachment of the National Guard."

The Fort Leonard Wood Evaluation Team is comprised primarily of retired military, while the Guardsmen are active duty. So, they know the fears and dangers associated with this type of research; they have intimate knowledge of their customer.

Plunged into a minus 20 degree Fahrenheit refrigerated room the size of a football field, the decontamination team, better known as DECON, works within a sequential personnel decontamination line that includes a hut for showering off the contaminant, an inspection area where they are scanned with a wand-type sensor that detects any residual chemicals, then onto the interim area to shed the protection suit and then into the second hut to don civilian clothes.

The tests run in one-hour cycles, and the equipment includes water heaters, generators, batteries, hoses and spray nozzles — basic standard Army-issued HAZMAT equipment. The test equipment is set up in the cold room and then monitored for failure.

Most equipment is not designed for service in sub-freezing temperatures. Even humans are not equipped for the challenges of cold. One of the earliest findings was the need for cold-friendly fittings. In a cold environment even the thinnest gloves will provide resistance to certain manual tasks.

However, the idea is not to replace the equipment but to enhance its cold weather performance. When the system fails, the team identifies the particular item and either fixes it with a change in operation or reengineering the equipment.

"We are learning important 'little' things like an AA battery will last maybe 10 minutes in a zero degree cold room. The cold really drains the power," Weiss said. "Even tentage is hard to wrap to a metal frame. And these are only things you can learn in a cold environment."

And beyond the equipment failures, the team comments that working within CRREL's cold room is much more cost effective since the cold is controlled and stabilized. They further explained that even in Alaska it can warm up and interfere with the test criteria.

"These guys are doing a great job. They are very dedicated to their mission and realize the importance of the tests for Homeland Security in a cold environment," said Leonard Zabilansky, CRREL engineer and DECON team's host overseeing the facilities operations for the series of testing.

The next tests were conducted in February with a team from Alaska.

A test and evaluation team member exits the initial decontamination shower and begins to remove the protective footwear before proceeding to the inspection interim area.
(Photo by L.J. Zabilansky)

Muddy stream bank ideal for turtle habitat

By Heidi Helwig
Portland District

On a cold, rainy day in November 2005, Kat Beal studied a muddy stream bank in the Willamette Valley and smiled at the possibilities.

By summer, the banks of Warren Slough will be an attractive area for basking in the sun. Leave your towel at home, though. With any luck, the only ones basking will be western pond turtles in dire need of the new nesting area.

"Pond turtles require warm, sunny open areas for nesting and are particularly attracted to south-facing slopes where their nests can absorb maximum heating by the sun," said Beal, a Portland District wildlife biologist for the Willamette Valley Project.

She said the turtles "bake" their eggs in light-bulb shaped nest chambers they create by digging in hard, compacted dirt.

The nutrient-poor dirt along the banks of Warren Slough fit the bill for ideal turtle habitat. It was mostly void of vegetation. It was hard enough that the nesting chambers would not collapse on the eggs, and the sun had a clear path to the bank's southern exposure. Plus, it offers the two types of habitat western pond turtles need: aquatic and terrestrial.

"After 13 to 14 years of working with turtles, I just have a sense this is the best place," Beal said. But, the large population of western pond turtles, who call the southern sectors of Fern Ridge Reservoir home, have not been attracted to the Warren Slough area. Instead, they travel right past the area, known as the South Marsh Project, to reach what might appear to be more suitable nesting habitat upstream.

"[Warren Slough's] steep sides are a barrier to western pond turtles seeking upland sites," Beal said. "But the sites that the turtles deem more suitable are on private, unprotected lands. Predators dig up most nests every year."

These baby turtles like munching on mosquitos and other insect larvae. *(Courtesy of Kat Beal, wildlife biologist for the Willamette Valley Project)*

In October 2005, Beal began work to reshape about 300 feet of stream bank within the South Marsh Project, created another 200 feet of nesting berms and mowed and scraped areas of land to reduce exotic shrubs. The south-facing banks are now gently sloped and free of vegetation.

"Our hope is that by creating suitable habitat we can induce turtles to nest on public land where their nests can be protected," Beal said.

Though the same predators that dig up the nests on private property also inhabit the South Marsh area, Beal and her crew have the ability to control their access to the nests. In June and July, Beal said she will begin searching for nests. When she finds that the turtles are using the banks and berms in the summer, she will erect multi-strand electric fences to keep raccoons and foxes from robbing the nests. She also may cover each of the nests with a wire basket to further protect the eggs.

Once the turtles hatch, they are on their own. The hatchlings must find their own aquatic and terrestrial habitat, which is another reason the South Marsh area is ideal habitat.

"It's an advantage to have the nesting sites close to the water," Beal said. "There is no evidence that baby turtles have a natural instinct of how to find water — they just happen upon it. It's important turtles find water because, aside from using a waterway to travel from one place to another, the water also produces the turtles' favorite snack — mosquito and other insect larvae."

But, you have to take the good with the bad. The bad in this case is that, if Beal's efforts are successful, the South Marsh habitat area also will produce riparian predators' favorite snack — 10-gram turtle hatchlings.

The good news is that if the electric fences deter the fox and raccoon long enough, the western pond turtle will establish the South Marsh area as its home.

When that happens, Beal will once again find herself studying the muddy stream bank and smiling at the possibilities.

Projects quench Iraqi thirst for drinking water

By Claude D. McKinney
Gulf Region North

For many desert dwellers in Iraq, toting water home was just an initial step; next was treating the water so it was suitable for drinking. Now, the water carried home is so pure many do not bother to treat it prior to use. The U.S. Army Corps of Engineers is providing oversight for a number of water projects for 34 villages surrounding northern Iraq's largest city, Mosul.

"We have 44 wells either done or near completion in the greater Mosul area," said Lee Kenderdine, USACE resident engineer at the Mosul Resident Office.

"These are mostly village wells, about 230 meters deep, that will provide water to villages that did not have an adequate water supply before," he said.

The work also includes providing a pump and generator enclosed in a well room surrounding the well. The water is pumped from there to a raised water storage tank and then to the village. The capacity of each water storage tank is 35 cubic meters. Villagers still have to come to a community outlet to receive water, but it is the best water they or their ancestors have had for hundreds of years.

Iraqis observe the results of a completed water project. *(File photo)*

Contractors drill the Baashiqah village well, which will be 230 meters deep. *(File photo)*

"Maybe some future reconstruction project will pipe the water throughout the city and directly into the homes," said Antoine Jackson, the project engineer, Mosul Resident Office. "For now we have to be content that we are providing them with good water the likes of which they have not seen in their lifetime."

By the end of November, with the completion of the last 10 wells, 88,000 people had access to these water systems that will go a long way to a better and healthier quality of life.

The USACE Gulf Region North manages oversight of construction and renovation contracts in seven northern Iraq provinces. From August to October 2005, GRN employees oversaw the completion of 102 schools, five police stations, 17 border forts, seven fire stations, 13 water projects, five electrical projects, six transportation projects and one hospital renovation. The value of these 156 projects is more than $52.5 million. The immediate result of these projects is a more secure Iraq and better living conditions for its citizens.

Claude McKinney is the Public Affairs Officer at the U.S. Army Corps of Engineers, Gulf Region North. For more information, please contact Claude at 540-542-1437. E-mail requests can be sent to claude.d.mckinney@tac01.usace.army.mil.

For more information on the U.S. Army Corps of Engineers in Iraq, please visit www.grd.usace.army.mil.

National newspaper recognizes Huntsville Center engineer

By Becky Proaps
Huntsville Engineering and Support Center

A Huntsville Center engineer represented the Corps of Engineers and the Huntsville Center in a national advertisement that appeared in the *USA Today* newspaper Feb. 15.

Jason B. Adams, an industrial engineer in the Engineering Directorate, Cost Engineering, was one of 16 New Faces of Engineering featured in the advertisement. Adams appeared with 15 other engineering professionals from around the country. He is also featured on the National Engineers Week 2006 New Faces of Engineering Web site at http://www.eweek.org/site/Engineers/newfaces2006/index.shtml.

New Faces of Engineering is a recognition program that highlights the interesting and unique work of young engineers.

The Directorate of Engineering nominated Adams, Cost Engineering Team Leader for the Military Munitions Center of Expertise, because of his outstanding accomplishments so early in his career and specifically for his cost estimating work for the Ordnance and Explosives Directorate. His work was critical in conveying to Congress the magnitude of the problem of Military Munitions and Chemical Warfare Materials at Formerly Used Defense Sites. He assisted in the development of more than 1,000 cost-to-complete estimates.

"We've done a lot of work with the cost-to-complete efforts for the FUDS program," Adams said. "Over the last five years or so, there has been a strong effort toward achieving audit ability.

"The environmental program throughout the Army had major issues several years ago. We, being the Army, went through a Department of Defense Inspector General Audit on reporting environmental liabilities and failed the audit. After that, there was a great emphasis put on getting ready for future audits. The Chemical Warfare Materials program, at that time, had over $1 billion worth of estimated liabilities," Adams said.

One of Adams' responsibilities is helping district personnel and contractors in developing methods and processes for getting estimates prepared, ensuring there is solid documentation for the estimate and understanding of what is being estimated so that an auditor or future project manager can review the estimate and develop an understanding of what the estimate is for and how it was developed.

Jason Adams, an industrial engineer at the Huntsville Engineering and Support Center, received the honor as one of 16 New Faces of Engineering, featured in USA Today. *(File photo)*

Because of Adams' contributions, the FUDS CWM program was able to develop formal, complete and auditable estimates.

"We developed these estimates, and we were able to cut the projected costs that were over $1 billion down to $147 million," Adams said.

Adams received his bachelor's degree in industrial and systems engineering from the University of Alabama in Huntsville. His industrial engineering background helped him understand cost estimating, but it was his time spent as a co-op and student hire in the Ordnance and Explosives Directorate at the Huntsville Center that gave him the understanding of the Corps' FUDS Military Munitions Response Program.

"I've been with the Corps for 10 years — five years as a student and co-op in the Military Munitions Design Center, and it prepared me for when I moved to the cost estimating area," Adams said.

The notification saying he had been selected was in Adams' e-mail inbox for several days before he had the time to read it. When he finally read it, he was very surprised.

"I am so honored. Typically I would have deleted that e-mail because it didn't have a familiar name on it. But, I read the message and was so surprised."

Adams is deployed to New Orleans, La., as a quality assurance supervisor and office engineer in support of the Hurricane Katrina relief effort.

Lab offers regional cost estimates for rehabilitation, maintenance practices on installation training lands

Dr. Dick Gebhart and Sarah Nemeth
U.S. Army Engineer Research and Development Center — Construction Engineering Research Laboratory

The U.S. Army is responsible for managing millions of acres of land used to support a variety of training and testing activities. Increased use of this land results in deterioration that can adversely affect mission requirements and safety.

Various land rehabilitation and maintenance (LRAM) practices can offset this deterioration by physically or biologically controlling erosion and stabilizing land surfaces with vegetation. These practices frequently include the use of heavy equipment and farming implements to manipulate site characteristics, install erosion control materials and structures, prepare seedbeds, apply soil amendments, and seed or transplant vegetation.

Planning, designing, budgeting and implementing comprehensive LRAM projects requires information concerning component costs associated with erosion control and revegetation.

Differences in climate, geology, soils and vegetation types between Army installations result in significant cost variability.

The U.S. Army Engineer Research and Development Center — Construction Engineering Research Laboratory provided guidance regarding various elements of LRAM projects. First, the researchers divided the United States into regions with grossly similar climates, geology, soils and vegetation types. Next, current, regional cost data from various federal, state and private agencies of LRAM practices were obtained. Assembling and compiling cost data represented the final task of this effort.

These data and other information contained in the report are useful for selecting the most appropriate practice based on relative costs and desired results. For example, the cost of drilling grass seed might be 1.5 times greater than the cost of broadcasting seed, but improved germination and establishment of drilled seed compared to broadcast seed compensates for the difference in cost.

LRAM costs were highest in Pacific Coast, Northeast and Intermountain regions of the United States. This reflects higher cost of goods and services in Pacific Coast and Northeast regions, and greater distances to job sites coupled with reduced equipment availability and generally poorer soil conditions in the Intermountain region. Lowest land rehabilitation and maintenance costs were found within Northern Great Plains, Southern Great Plains, Central Lake and Humid South regions of the United States. Well-developed agricultural production enterprises within these regions result in greater equipment availability, higher proportion of experienced, agriculturally oriented contractors and vendors, and generally lower labor and material charges.

The results of this project apply to all U.S. Army installations within the continental United States. The data presented in this report should be used with caution. It should be noted that without periodic update, the actual cost estimates presented in this report may not be representative for more than a few years. However, relative costs between different LRAM practices should remain reasonably constant. Due to the large majority of cost references obtained from the Internet, an individual may want to review the Internet during the planning and budgeting processes, as information is continually updated.

For more information, please contact Dr. Dick Gebhart at, 1-800-872-2375, ext. 5847 or dick.l.gebhart@erdc.usace.army.mil, or Sarah Nemeth at , 1-800-872-2375, ext. 4571 or sarah.b.nemeth@erdc.usace.army.mil.

Earthwork is a common component of many land rehabilitation and maintenance projects and can often be done by engineering units. *(File photo)*

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The patent issued to Shearer and Jackson for this technology, U.S. Patent No. 6,569,807, covers not only the fungus studied, but any fungus that produces microscleratia in broth culture and can be used for aquatic plant control.

Dr. Beth Fleming, Environmental Lab director at ERDC, signs patent license agreement. *(Photo by Richard Read, ERDC Visual Production Center)*

"The next step in product development of the mycoherbicide is formulation of the fungus," Shearer said. "We are in the process of coating the microscleratia with different polymers in search of ones that enhance product performance in an aquatic system. Formulation is being researched at NCAUR and product testing is taking place at ERDC and SePRO."

According to Shearer, adding a mycoherbicide to SePRO's product line has definite advantages. "Being a biological, it offers an alternative product that may be viewed as environmentally friendly," she said. "Second, the fungus is compatible with fluridone, and when used in combination at low rates, it offers better control of hydrilla than either agent used alone. Finally, it would add an additional product to a very limited number of control options currently available for hydrilla management."

Because of these advantages, SePRO became interested in licensing the patent, and the agreement was signed on Dec. 21, 2005.

According to Bea Shahin, ERDC technology transfer officer, the patent is a joint patent between USDA-ARS and ERDC-EL. The patent license agreement is also a three-way agreement between USDA-ARS, ERDC-EL and SePRO.

"We feel that it is one of the best patent licenses to come out recently," Shahin said. "Once the licensed product is brought into practical application, it will be marketed and can be used by different entities to manage hydrilla populations. SePRO has submitted a commercialization plan that will potentially yield high results and sales of the product once development and testing are completed. The Corps and USDA-ARS will be getting royalties from the sales."

For more information about this technology, contact Dr. Judy Shearer at 601-634-2516 or Judy.F.Shearer@erdc.usace.army.mil.

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